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22428	7590	03/09/2004	EXAMINER	
FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			FETZNER, TIFFANY A	
			ART UNIT	PAPER NUMBER
			2859	

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/065,848

Applicant(s)

LASKARIS ET AL.

Examiner

Tiffany A Feltzner

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/25/2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02/25/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. The changes made to **35 U.S.C. 102(e)** by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. **Claims 20-22** are rejected under **35 U.S.C. 102(e)** as being anticipated by **Cheng et al.**, US patent application Publication 2003/0001575 A1 published January 2nd 2003 with an effective prior art date of January 19th 2000. The effective PCT in the priority chain has an international filing date of January 19th 2001, therefore the changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002, **do apply**.

4. **Claims 20-22** are also rejected under **35 U.S.C. 102(b)** as being anticipated by **Cheng et al.**, PCT publication **WO 01/53847** A1 published July 26th 2001.

5. With respect to **Claim 20**, **Cheng et al.**, teaches and shows "A magnetic resonance imaging (MRI) apparatus for imaging a volume, comprising: means for generating a magnetic field for imaging said volume" {See figures 1 through 4; magnetic elements / poles component number 2 which are made of NdFeB, a permanently magnetized material; abstract; page 2 paragraphs [0016] and [0031] of **Cheng et al.**, '575 and page 4 line 18 through page 5 line 7; with page 7 lines 15-21 of **Cheng et al.**, **WO 01/53847**}; **Cheng et al.**, also teaches and shows a "means for shielding said means for generating" (i.e. the flat corner NdFeB magnet pieces), {See **Cheng et al.**, '575 Figures 1 and 4; page 2 paragraphs [0016], [0027], [0032] and page 3 paragraph [0035] and **Cheng et al.**, **WO 01/53847** page 4 line 18 through page 5 line 7; page 6 lines 15-20; page 7 lines 23-27; page 8 line 29 through page 9 line 13 }, "and means for shaping said magnetic field." (i.e. component 4 the tape winding spirals of silicon steel that comprise the composite pole plate components). {See **Cheng et al.**, '575 page 2 paragraphs [0016], [0031] page 3 paragraphs [0036] through [0040] and **Cheng et al.**, **WO 01/53847** page 4 line 18 through page 5 line 7; page 7 lines 15-21; page 9 line 15 through page 10 line 30.}.

6. With respect to **Claim 21**, **Cheng et al.**, '575 and **WO 01/53847** teach and show a "means for supporting" (i.e. the arms component 10 shown in figure 1) "said means for generating" (i.e. component 2) "said means for shielding" (i.e. component 3), "and said means for shaping"(i.e. component 4) {See Figures 1, 2, 3, 4, page 1

paragraph [0016] through page 3 paragraph [0040]; and corresponding pages 4 line 18 through page 10 line 30 in **WO 01/53847**}. The same reasons for rejection, that apply to **claim 20** also apply to **claim 21** and need not be reiterated.

7. With respect to **Claim 22, Cheng et al., '575** and **WO 01/53847** teach and show a "means for shielding interactions between coils of opposite polarity." {See corner pole plate component(s) 3, composite pole-plate(s) 4 and the ring component(s) 5; Figures 1, 2, 3, 4, page 1 paragraph [0016] through page 3 paragraph [0040] and corresponding pages 4 line 18 through page 10 line 30 in **WO 01/53847**}. The same reasons for rejection, that apply to **claim 20** also apply to **claim 22** and need not be reiterated.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. **Claims 1-19** are rejected under **35 U.S.C. 103(a)** as being unpatentable over **Cheng et al.**, US patent application Publication **2003/0001575 A1** published January 2nd 2003 with a priority PCT international filing date of January 19th 2001, and an effective prior art date of January 19th 2000.

11. **Claims 1-19** are also rejected under **35 U.S.C. 103(a)** as being unpatentable over **Cheng et al.**, PCT publication **WO 01/53847 A1** published July 26th 2001.

12. The examiner notes that the **Cheng et al.**, **WO 01/53847** reference corresponds to the **2003/0001575 A1** reference mentioned above. In order to avoid confusion, the citations provided for **claims 1-19** are from the US **2003/0001575 A1** reference, which has the oldest effective date of January 19th 2000. However the exact same figures, component numbers, and abstract are found in the **Cheng et al.**, **WO 01/53847** reference. Additionally, the teachings of **Cheng et al.**, **2003/0001575 A1** page 1 paragraph [0016] through page 3 paragraph [0040] correspond to the teachings of page 4 line 18 through page 10 line 30 in **WO 01/53847**, therefore the examiner is citing only one set of citations, to avoid confusion, however both references are being individually applied to all claims. The examiner also notes that corresponding Figures 5 and 6 from the **WO 01/53847**, reference, are cleaner, and show the eight wedged pole-piece sections of component 4 more easily}.

13. With respect to **Claim 1**, **Cheng et al.**, teaches and shows "An open magnetic resonance imaging (MRI) device" [See figure 1, and page 2 paragraph [0028]], **Cheng et al.**, lacks directly stating that "at least one main coil for generating a magnetic field for imaging a volume" However, **Cheng et al.**, teaches and shows a main magnetic

element / pole component 2, that generates “a magnetic field for imaging a volume”.

{See page 2 paragraph [0016] and [0031]}. The examiner notes that in figure 1 the main magnetic generating component is shown to be circular, and in combination with figure 5 is suggestively a circular single loop main magnetic coil / element with a central axis defined by the circular hole that extends through pole piece component 4 which is mounted on top of the main magnetic element / pole component 2. A single loop coil necessarily has a space / hole through the central axis, and there is no teaching in the **Cheng et al.**, reference to suggest that the main magnet component lacks a central axis, therefore even though the **Cheng et al.**, reference lacks explicitly stating that the main magnet generating means is a coil. The presence of two single looped main magnetic field generating coil's (i.e. one on either side of the imaging volume) is suggested by the combination of Figures 1 and 5 in the **Cheng et al.**, reference.

14. **Cheng et al.**, also lacks directly stating that the open MRI structure has “at least one shaping coil”, however, the pole-plate components identified as component 4 in the **Cheng et al.**, reference, function to control the shape the magnetic field in the imaging volume gap between the two pole plates. {See page 2 paragraph [0031]}. Because the shape of the magnetic field is being controlled the examiner is considering the pole-plates identified as component 4, shown in figure 1 which comprise a tape wound (i.e. coiled) laminated thin sheet of silicon steel with an insulating adhesive between the layers, mounted on magnetic pole component 2) {See Figure 1, page 2 paragraphs [0016], [0031], as a type of “shaping coil”.

15. **Cheng et al.**, shows "said at least one shaping coil (i.e. the tape winding spiral long thin strips of silicon steel elements which comprise pole plate component 4 are broadly interpreted as shaping coils, because they assist in shaping the magnetic field;) "being positioned relative to said at least one main coil" (i.e. component 2 in figure 1) "to shape said magnetic field in said volume". {See figure 1, components 2 and 4 page 3 paragraphs [0036] through [0039] and page 2 paragraph [0031]}.

16. With respect to **Claim 2**, **Cheng et al.**, teaches and shows "a single unit support structure" {See Figure 1 component 1 page 2 paragraph [0034] where component 1 is a single cast piece (i.e. "a single unit support structure")}, "wherein said at least one main coil" (i.e. component 2) "is positioned on an outer surface of said single unit support structure", (i.e. {See figure 1} "and wherein said at least one shaping coil" (i.e. the elements which comprise component 4 are interpreted as shaping coils {See page 3 paragraphs [0036] through [0040]}) "is positioned on an inner surface of said single unit support structure". {See figure 1}. The same reasons for rejection, and obviousness that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

17. With respect to **Claim 3**, **Cheng et al.**, shows that "said single unit support structure comprises: a substantially cylindrical shell;" [See figures 1 through 4] "a hub" (i.e. the center of the magnetic pole pieces 2, pole plates 4, and rings 5, comprise the "hub" of the **Cheng et al.**, MRI open structure. **Cheng et al.**, shows from figures 1, 5, and 6 that the "hub" is "positioned along a substantially central axis of said cylindrical shell". **Cheng et al.**, also shows a plurality of gussets" (i.e. the triangular, wedge-like sections of pole plates 4 and rings 5, which are shown in figures 5, 6 and functionally

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strengthen the frame / structure of **Cheng et al.**,’s open C magnet system. {See figures 5, 6, page 3 paragraphs [0036] through [0039]} which are “positioned within said cylindrical shell”, {See figures 1, 5, and 6} “each of said gussets” (i.e. each triangular shaped section / wedge) “extending radially outward” (i.e. the point of each triangular “gusset” is at the “hub” with the wider base of each triangular “gusset” is at the outer edge of pole piece 2, pole plate 4, and ring 5) “from said hub” {See figures 1, 5, and 6}. The same reasons for rejection, and obviousness that apply to **claims 1, 2** also apply to **claim 3** and need not be reiterated.

18. With respect to **Claim 4, Cheng et al.**, shows that “at least one support post positioned between a first half and a second half of said cylindrical shell.” {See figures 1, 2, 3, and 4}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 3** also apply to **claim 4** and need not be reiterated.

19. With respect to **Claim 5, Cheng et al.**, shows that “at least one support post is attached on one end to a flange” (i.e. the ends of the arms adjacent to the imaging volume which are beveled inward on the opposite side from the imaging volume, and upon which pole piece component 2 are mounted are “flanges formed on the first half of said cylindrical shell and attached on an opposite end to a flange formed on the second half of said cylindrical shell”. {See figures 1, 2, 3, and 4}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 3, 4** also apply to **claim 5** and need not be reiterated.

20. With respect to **Claim 6, Cheng et al.**, teaches that at least one of: said cylindrical shell, said hub, and said gussets comprise one of stainless steel, aluminum,

and fiber-reinforced composites.” {See page 3 paragraphs [0036] through [0040], and page 2 paragraph [0034] where the silicon steel used by **Cheng et al.**, is interpreted by the examiner as a type of stainless steel because of its high resistivity and high immunity to rusting or corrosion}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 3** also apply to **claim 6** and need not be reiterated.

21. With respect to **Claim 7, Cheng et al.**, shows “at least one ferromagnetic ring positioned on an outer surface of said single unit support structure.” {See Figures 1, 3, 4, and 6 component 5 page 3 paragraphs [0036] through [0040], and page 2 paragraph [0031] } The same reasons for rejection, and obviousness that apply to **claims 1, 2** also apply to **claim 7** and need not be reiterated.

22. With respect to **Claim 8, Cheng et al.**, teaches that on the inside faces of the arms 10 of the yoke 1 are mounted two oppositely poled magnet elements component 2. {See page 2 paragraph [0031]}. **Cheng et al.**, also teaches that pole plate component 4 must average out the field produced by the permanent magnet material of the magnet pole on which it is mounted, (i.e. the polarity of the pole plate is opposite to the respective pole on which it is mounted. Therefore in the **Cheng et al.**, reference the magnet poles 2 and the pole-plates 4 each have opposite polarity.

23. **Cheng et al.**, also teaches that the material used for the pole plate component 4, and ring components 5 is a thin strip of silicon steel that has been folded over itself and laminated together. {See page 3 paragraph [0037]}. The fact that the thin strip of silicon steel has been “folded over itself” directly suggests that the individual ring components are made up of two ring elements with oppositely flowing currents, because ‘folding

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over” the strip causes the current in the top folded-over section to be in a first direction, and the current through the bottom folded-over section to be in a second direction, opposite to the first direction. Additionally **Cheng et al.**, teaches “at least one ferromagnetic ring” (i.e. component 5 in figures 1, 3, 4, and 5) “is positioned substantially between coils having opposite current directions” (i.e. components 5 are located between magnetic coil components 2, and pole-plate shaping coil elements 4; which each have opposite current directions). {See figures 1, 3, 4,} The ability “to shield interactions” (i.e. eddy currents, reduction of field strength, and saturation which reduces efficiency of the magnet and increases the leakage flux) {See page 3 paragraphs [0036] through [0037]} “between the coils having opposite current directions” (i.e. between magnetic coil components 2, and pole-plate shaping coil elements 4) is taught by page 3 paragraphs [0036] through [0040]}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 7** also apply to **claim 8** and need not be reiterated.

24. With respect to **Claim 9**, the **Cheng et al.**, reference directly suggests that “said MRI device comprises at least four ferromagnetic rings”, because each ring component 5 has at least two oppositely directed layers via the ‘folding-over’ process therefore the presence of the two ring components 5, which each have at least two layers directly suggests four ring components. {See figures 1, 3, 4, and 6; page 3 paragraphs [0036] through [0040]}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 7** also apply to **claim 9** and need not be reiterated.

25. With respect to **Claim 10**, the **Cheng et al.**, reference directly suggests at least one bucking coil" (i.e. the substantially flat magnetized NdFeB plate(s) component 3 {See figures 1, 4}, mounted on the inside face of each of the diagonal sections of the yoke, in a face to face relationship with an angle of approximately 45 degrees in relationship to the post of the MRI yoke, is interpreted by the examiner to be a substantially flat "bucking coil"), because applicant is allowed to be their own lexicographer, and the substantially flat magnetized NdFeB plate(s) component 3 is shown and taught by the **Cheng et al.**, reference to be "positioned on an outer surface of said single unit support structure for shielding the magnetic field." {See figures 1, and 4; page 1 paragraph [0016] through page 2 paragraph [0016]; page 2 paragraphs [0027], [0032], and page 3 paragraph [0035]}. The same reasons for rejection, and obviousness that apply to **claims 1, 2**, also apply to **claim 10** and need not be reiterated.

26. With respect to **Claim 11**, the **Cheng et al.**, reference directly suggests "at least two bucking coils". {See the two components identified by component number 3, figures 1, and 4; page 1 paragraph [0016] through page 2 paragraph [0016]; page 2 paragraphs [0027], [0032], and page 3 paragraph [0035]}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 10** also apply to **claim 11** and need not be reiterated.

27. With respect to **Claim 12**, the **Cheng et al.**, reference teaches, and suggests via figures 5, and 6 that there are at least eight wedge shaped components that comprise each pole plate component 4, which shapes the magnetic field, therefore the **Cheng et**

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al., reference also teaches, and suggests via figures 5, and 6 the presence of “at least eight shaping coils” because up to 16 shaping coils (i.e. eight per pole piece on either side of the imaging volume) are directly suggested from figures 1, 5, and 6 in combination; while even more than that are suggested if the individual layers of coil winding within each wedge shaping component are accounted for. [See figures 1, 5, 6; page 3 paragraphs [0036] through [0040] where the at least six wedge shaped components, made up of silicon steel tape windings laminated together that comprise each pole plate component 4, and shape the magnetic field, are interpreted by the examiner as shaping coils.} The examiner notes that the best images of **Cheng et al.**’s Figures 5 and 6 come from the **WO 01/53847** reference. The same reasons for rejection, and obviousness that apply to **claim 1**, also apply to **claim 12** and need not be reiterated.

28. With respect to **Claim 13**, the **Cheng et al.**, reference lacks directly teaching that “said at least one shaping coil shapes said magnetic field in said volume to a uniformity of at least 10 ppm.”, However, the **Cheng et al.**, invention produces a uniform 0.35 Tesla or 3,500 Gauss uniform magnetic field across its vertical extent, with all of the components interacting. The uniform imaging volume has a 0.47 meter vertical extent, therefore It would have been obvious to one of ordinary skill in the art at the time that the invention was made that upon performing the conversion to account for the ppm per parts per million scale that the **Cheng et al.**, reference does suggest a uniformity of at least 10 ppm. {See page 2 paragraphs [0017] and [0018] of **Cheng et al.**,’575; and

page 5 lines 9-17 of **Cheng et al.**, WO 01/53847}. The same reasons for rejection, and obviousness that apply to **claim 1**, also apply to **claim 13** and need not be reiterated.

29. With respect to **Claim 14**, the **Cheng et al.**, reference shows, and suggests via figures 5, and 6 "an even number of shaping coils" {See figures 1, 5, 6; page 3 paragraphs [0036] through [0040], where the at least six wedge shaped components, made up of silicon steel tape windings laminated together that comprise each pole plate component 4, and shape the magnetic field, are interpreted by the examiner as shaping coils.} The same reasons for rejection, and obviousness that apply to **claim 1**, also apply to **claim 14** and need not be reiterated.

30. With respect to **Claim 15**, the **Cheng et al.**, reference directly suggests from the teachings of the reference that "a first half of the number of shaping coils have a first magnetic polarity and a second half of the number of shaping coils have a second magnetic polarity substantially opposite that of said first magnetic polarity"; because **Cheng et al.**, teaches that pole plate (i.e. shaping coil) component(s) 4 must average out the field produced by the permanent magnet material of the magnet pole on which it is mounted, (i.e. the polarity of the pole plate is necessarily opposite to the respective pole on which it is mounted). Therefore in the **Cheng et al.**, reference the magnet poles 2 and the pole-plates 4 each have opposite polarity, (i.e, half the pole piece shaping coil components have one polarity, while the other half have an opposite polarity.) This feature is also suggested by **Cheng et al.**, in a second manner, because **Cheng et al.**, also teaches that the material used for the individual pole plate component(s) 4, and ring component(s) 5 is a thin strip of silicon steel that has been folded over itself and

laminated together. {See page 3 paragraph [0037]}. The fact that the thin strip of silicon steel has been “folded over itself” directly suggests that the individual pole piece components are made up of elements with oppositely flowing currents, because ‘folding over’ the strip causes the current in the top folded-over section to be in a first direction, and the current through the bottom folded-over section to be in a second direction, opposite to the first direction. {See page 3 paragraphs [0036] through [0040], figures 1, 3, 4, 5, and 6}. The same reasons for rejection, and obviousness that apply to **claims 1, 14**, also apply to **claim 15** and need not be reiterated.

31. With respect to **Claim 16**, the **Cheng et al.**, reference directly suggests from the teachings of the reference “a plurality of shaping coils”, (i.e. component(s) number 4 are interpreted by the examiner as shaping coils) “at least one of said plurality of shaping coils having a magnetic polarity opposite to a magnetic polarity of another of said plurality of shaping coils.” {See page 3 paragraphs [0036] through [0040], figures 1, 3, 4, 5, and 6; and the detailed rejections of **claims 7, 14, and 15**}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 7, 14, 15** also apply to **claim 16** and need not be reiterated.

32. With respect to **Claim 17**, the **Cheng et al.**, reference lacks directly teaching the terms “main coil”, “bucking coil”, and “shaping coil”. However It would have been obvious to one of ordinary skill in the art at the time that the invention was made that the **Cheng et al.**, reference does teach components that are functionally equivalent / synonymous terms for there components given the context of the reference. Specifically the examiner considers component 2, the main magnetic component of the **Cheng et**

al., reference to be functionally equivalent to applicant's "main coil"; the examiner considers component 3, the substantially flat corner magnetic pieces of the **Cheng et al.**, reference to be functionally equivalent to applicant's "bucking coil"; and the examiner considers component 4, the pole piece component(s) comprising tape windings of silicon steel in the **Cheng et al.**, reference to be functionally equivalent to applicant's "shaping coil"; as mentioned in all the earlier rejections of this action.

33. More specifically, the **Cheng et al.**, reference teaches, "A magnetic resonance imaging (MRI) apparatus for imaging a volume, comprising : at least one main coil configured to generate a magnetic field", (i.e. component number 2) "at least one bucking coil" (i.e. component number 3) "configured to shield said at least one main coil;" {See the two components identified by component number 3, figures 1, and 4; page 1 paragraph [0016] through page 2 paragraph [0016]; page 2 paragraphs [0027], [0032], and page 3 paragraph [0035]}; "a plurality of shaping coils to shape said magnetic field in said volume" {See figures 1, 5, 6; page 3 paragraphs [0036] through [0040], where the at least six wedge shaped components, made up of silicon steel tape windings laminated together that comprise each pole plate component 4, and shape the magnetic field, are interpreted by the examiner as shaping coils.} "and a plurality of ferromagnetic rings" (i.e. component number 5) "for shielding interactions between coils of opposite polarity, at least one of said plurality of ferromagnetic rings being positioned between said at least one main coil and said at least one bucking coil" {See the rejections of claims 1, 7, 10, 11, 14, 15, 16; Figures 1 through 6}. The same reasons for

rejection, and obviousness that apply to **claims 1, 2, 7, 10, 14, 15, 16** also apply to **claim 17** and need not be reiterated.

34. With respect to **Claim 18**, the **Cheng et al.**, reference shows "a single unit support structure" {See figures 1, 2, 3, and 4} for supporting said at least one main coil, (i.e. component number 2) "said at least one bucking coil" (i.e. component number 3) "said plurality of shaping coils", (i.e. component number 4) "and said plurality of ferromagnetic rings" (i.e. component number 3) " {See figures 1, 2, 3, and 4; page 1 paragraph [0016] through page 3 paragraph [0040]}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 7, 10, 14, 15, 16, 17** also apply to **claim 18** and need not be reiterated.

35. With respect to **Claim 19**, the **Cheng et al.**, reference shows and teaches from **the earlier rejections of claims 1, 2, 3**, which need not be reiterated that "said single unit support structure comprises: a substantially cylindrical shell; a hub positioned along a substantially central axis of said cylindrical shell", and a plurality of gussets positioned within said cylindrical shell, each of said gussets extending radially outward from said hub." {See figures 1, 2, 3, and 4; page 1 paragraph [0016] through page 3 paragraph [0040]}. The same reasons for rejection, and obviousness that apply to **claims 1, 2, 3, 7, 10, 14, 15, 16, 17, 18** also apply to **claim 19** and need not be reiterated.

Specification

36. The disclosure is objected to because of the following informalities:

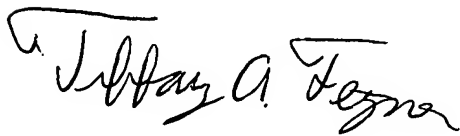
A) On page 7 paragraph [0030] line 4 **delete** "Fig. 2," and **insert** "fig. 1," because the components mentioned are shown in figure 1 not figure 2.

B) Figures 2 and 3 each show component 102, it is unclear from the disclosure on page 6 paragraph [0016] if applicant intended one of these figures to the other half component 101. The examiner asks applicant to review the wording of page [0027] to ensure that the figures are correct. Appropriate correction if necessary is required.

Conclusion

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

38. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(703) 872-9306**.



TAF
February 22, 2004



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